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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,533	05/19/2005	Hideo Hada	SHIGA7.016APC	7182

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EXAMINER

CHU, JOHN S Y

ART UNIT	PAPER NUMBER
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1752

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	03/09/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 03/09/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
eOAPilot@kmob.com

Office Action Summary

Application No.

10/535,533

Applicant(s)

HADA ETAL

Examiner

John S. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7, 9 and 11-15 is/are rejected.
- 7) ☒ Claim(s) 4, 8 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/6/05, 5/19/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This Office action is in response to the application filed May 19, 2006.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

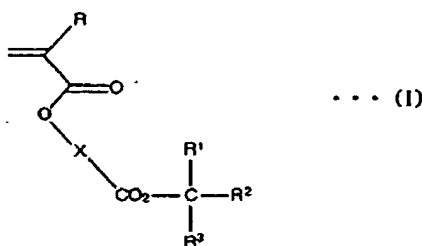
2. Claims 1-3, 5-7, 9, and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over IWAI et al (WO 03/048861 (PCT/JP02/12524)), or HADA et al (WO 03/048863 (PCT/JP02/13538)).

The claimed invention is drawn to the following:

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1. A method of forming a resist pattern comprising: a resist pattern formation step, in which a positive resist composition comprising a resin component (A) that displays increased alkali solubility under action of acid, and an acid generator component (B) that generates acid on exposure is applied to a substrate, a prebake is conducted, said resist composition is selectively exposed, post exposure baking (PEB) is conducted, and alkali developing is used to form a resist pattern; and a narrowing step in which a pattern size of said resist pattern is narrowed by heat treatment, wherein

said component (A) utilizes a resin with a structural unit (a1) derived from a (meth)acrylate ester represented by a general formula (I) shown below:



wherein, R represents a hydrogen atom or a methyl group; X represents a hydrocarbon group with 1 to 4 rings; R¹ to R³ either each represent, independently, a lower alkyl group, or alternatively, one of R¹ to R³ represents a lower alkyl group, and two remaining groups represent lower alkylene groups, terminals of which are bonded together to form a single ring containing 5 or 6 carbon atoms including bonded terminal carbon atoms.

IWAI et al disclose a positive resist composition comprising a resin, a photoacid generator, and an amine compound used in a method wherein a post-exposure bake and a post-development bake are disclosed. The narrowing of the pattern is not explicitly disclosed, however the use of a drying step is would inherently provide a narrowing process wherein the removal of solvent would cause the patterned areas to shrink due to the departure of the solvent. Particularly, Example 1, in IWAI et al discloses a method wherein the film is subjected to a post-exposure bake (PEB) at 110 degrees for 90 seconds, developed, washed with water and dried. This drying step meets the recited narrowing step which is claimed to be a performed by a heat

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treatment. This drying step would be seen to narrow the patterned image when the water is removed, to cause shrinkage.

The prior art example lacks the specific structural unit used in the working example with the drying step, however the structural unit is known and disclosed in the reference at Examples 13 and 14.

It would have been *prima facie* obvious to one of ordinary skill in the art of positive photoresist methods and processing to use known copolymers as in Example 13 and 14 in the method of Example 1 with and reasonably expect same or similar results as disclosed in IWAI et al for a reduction in defects and pattern abnormalities.

HADA et al disclose a positive resist composition comprising a resin, a photoacid generator, and an amine compound used in a method wherein a post-exposure bake and a post-development bake are disclosed. The narrowing of the pattern is not explicitly disclosed, however the use of a drying step would inherently provide a narrowing process wherein the removal of solvent would cause the patterned areas to shrink due to the departure of the solvent. Particularly, Example 1, in HADA et al discloses a method wherein the film is subjected to a post-exposure bake (PEB) at 125 degrees for 90 seconds, developed, washed with water and dried. This drying step meets the recited narrowing step which is claimed to be performed by a heat treatment. This drying step would be seen to narrow the patterned image when the water is removed, to cause shrinkage.

The prior art example lacks the specific structural unit used in the working example with the drying step, however the structural unit is known and disclosed in a copolymer in the reference at claim 2.

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It would have been *prima facie* obvious to one of ordinary skill in the art of positive photoresist methods and processing to use known copolymers as recited in claim 2 in the method of Example 1 with and reasonably expect same or similar results as disclosed in HADA et al for a reduction in defects and pattern abnormalities.

3. Claims 4, 8, and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

None of the references of record disclose the recited limitations as stated in the claims above.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Chu whose telephone number is (571) 272-1329. The examiner can normally be reached on Monday - Friday from 9:30 am to 6:00 pm.

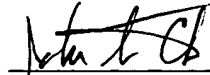
If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Cynthia Kelly, can be reached on (571) 272-1526

The fax phone number for the USPTO is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PMR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John S. Chu

Primary Examiner, Group 1700

J.Chu

March 4, 2007